

Embedded 3D Nonvolatile Memory, Phase I

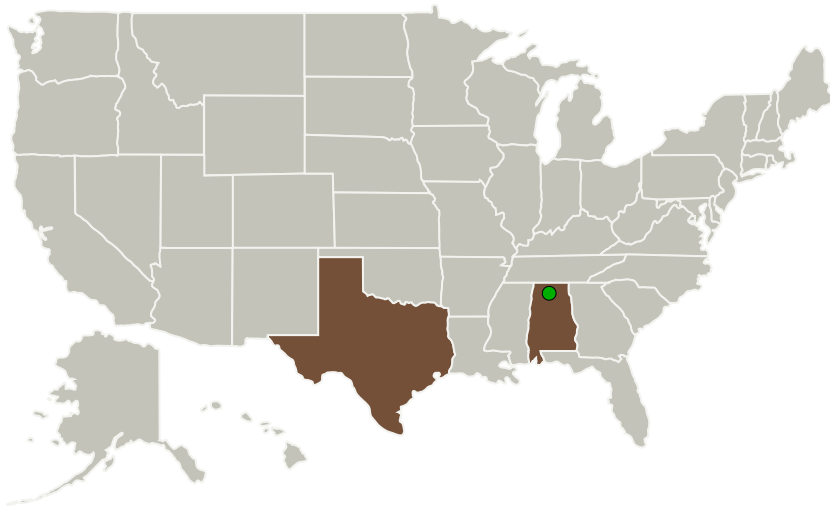
Completed Technology Project (2011 - 2011)



Project Introduction

Integrated circuits in NASA spacecraft and vehicle electronics must operate over large temperature extremes and mitigate radiation effects that can result in upset and/or destruction of devices. PrivaTran has previously demonstrated a two-terminal, electronically-programmable resistor as a nonvolatile memory (NVM) element with performance metrics exceeding those of competing technologies, and herein proposes this device as a radiation hardened NVM array formed within the metal interconnect layers of the integrated circuit and fully integrated in a 3D architecture, resulting in significant savings in weight, power and reliability.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
PrivaTran	Lead Organization	Industry	Austin, Texas
 Marshall Space Flight Center (MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

Primary U.S. Work Locations

Alabama	Texas
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Project Transitions

 **February 2011:** Project Start

 **September 2011:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138126>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

PrivaTran

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

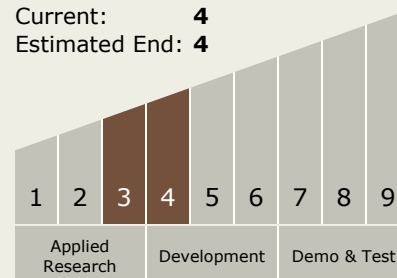
Burt Fowler

Technology Maturity (TRL)

Start: 3

Current: 4

Estimated End: 4



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Technology Areas

Primary:

- TX10 Autonomous Systems
 - └ TX10.1 Situational and Self Awareness
 - └ TX10.1.4 Hazard Assessment

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System